

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS

1. (currently amended) ~~[[For]]~~In a network comprised of a plurality of interconnected ~~process management modules respectively~~processes associated with processes for operation of a fossil fuel power plant, a method for assigning credit to a first input of a first process for operation of the fossil fuel power plant ~~with respect, the credit measuring a contribution of the first input~~ to a global output of the network ~~indicative of, wherein the global output is a profit generated by operation of the fossil fuel power plant, the first process having a plurality of inputs and outputs, at least one of said outputs of the first process being a chained output that is an input to a second process for operation of the fossil fuel power plant and contributes to the global output of the network,~~ the method comprising:

obtaining ~~[[a]]credit assignments~~assignment for each of the chained outputs of the first process for operation of the fossil fuel power plant with respect to the global output ~~of the network indicative of the profit generated by the fossil fuel power plant, wherein the credit assigned to each of the chained outputs of the first process are a measure of the contribution of the chained output on the global output;~~

using a model-based controller having a first-order differentiable model of the first process ~~of the fossil fuel power plant~~ to derive a local credit assignment for the first input of the first process, wherein the local credit assigned to the first input is a measure of the contribution of the first input on outputs of the first process; and

using a local processor to apply~~applying~~ a chain rule for ordered partial derivatives using (a) the first-order differentiable model of the first process, (b) the local credit assignment for the first input, and (c) the credit assignments for the chained outputs of the first process with respect to the global output to assign the credit to the first input of the first process with respect to the global output of the network.

2. (original) The method of claim 1, wherein the first-order differentiable model is a neural network.
3. (original) The method of claim 1, wherein the first-order differentiable model is a first-principles model.
4. (currently amended) The method of claim 1, wherein the method includes managing the first process is ~~managed by using~~ a first process management module and the first process management module determines ~~determining~~ the credit assignment of the first input using the first process management module.
5. (currently amended) The method of claim 1, ~~wherein~~ further comprising:
managing the first process is ~~managed by using~~ a first process management module; and
the first process management module transmits
transmitting the local credit assignment over [[a]]the network, from the first process management module, to a second process management module, wherein ~~program that~~ the second process management module computes the credit assignment for the first input.

Claims 6-17 (canceled)

18. (currently amended) A computer program product ~~residing stored~~ on a computer readable medium for use in analyzing a first process for operation of a fossil fuel power plant, the first process having a plurality of inputs and at least one output, at least one of said outputs being a chained output that is an input to a second process in [[the]]a network of process management modules respectively associated with processes for operation of the fossil fuel power plant, and contributes to a global output ~~indicative of~~ the network, wherein the global output is a profit generated by operation of the fossil fuel power plant, the computer program product containing instructions for causing a computer to:

obtain [[a]]credit assignmentsassignment for each of the chained outputs of the first process for operation of the fossil fuel power plant with respect to the global output

~~indicative of the profit generated by the fossil fuel power plant using an application program interface, wherein the credit assigned to each of the chained outputs of the first process are a measure of the contribution of the chained outputs on the global output;~~

~~obtain a first-order-differentiable model of the first process of the fossil fuel power plant; and~~

~~apply a chain rule for ordered partial derivatives to the first-order-differentiable model using the credit assignments for the chained outputs of the first process with respect to the global output to determine a credit of the first input of the first process with respect to the global output of the network, wherein the credit of the first input is a measure of the contribution of the first input on the global output.~~

19. (original) The computer program product of claim 18, wherein the first-order-differentiable model is a neural network.

20. (original) The computer program product of claim 18, wherein the first-order-differentiable model is a first-principles model.

Claim 21 (canceled)

22. (currently amended) The computer program product of claim 18, wherein the first-order-differentiable model is changed due to (a) a change in operating region of the first process, (b) retaining of the model, or (c) a physical change in the first process~~can be adapted.~~

Claim 23 (canceled)

24. (currently amended) The method of claim 1, wherein said first and second processes for operation of the fossil fuel power plant are selected from the group consisting of the following processes: combustion optimization, sootblowing optimization, boiler performance optimization, selective catalytic reduction (SCR) optimization, flue gas desulfurization (FGD) optimization, and profit optimization.

25. (currently amended) The method of claim 1, wherein the first process is combustion optimization, said first input of the first process is selected from the group consisting of: O₂ trim, over fire air (OFA), mill biases, SAD, and cleanliness; and an output of the first process is selected from the group consisting of: boiler losses, boiler NO_x and boiler SO_x.

26. (currently amended) The method of claim 1, wherein the first process is sootblowing optimization, said first input of the first process is selected from the group consisting of: location, pressure and frequency of sootblowing operations; and an output of the first process is selected from the group consisting of: soot losses and cleanliness.

27. (currently amended) The method of claim 1, wherein the first process is SCR optimization, said first input of the first process is selected from the group consisting of: boiler NO_x and NH₃; and an output of the first process is selected from the group consisting of: SCR losses and NO_x.

28. (currently amended) The method of claim 1, wherein the first process is FGD optimization, said first input of the first process is selected from the group consisting of: boiler SO_x and limestone; and an output of the first process is selected from the group consisting of: FGD losses and SO_x.

29. (currently amended) The method of claim 1, wherein the first process is boiler performance optimization, said first input of the first process is selected from the group consisting of: soot losses, cleanliness, boiler losses, SCR losses and FGD losses; and an output of the first process is selected from the group consisting of: heat rate (HR) and MW.

30. (currently amended) The method of claim 1, wherein the method includes managing the first process ~~is managed by using~~ a first process management module, ~~wherein the first management module~~ [[is]]selected from the group consisting of: a module for optimizing combustion; a module for optimizing sootblowing; a module for optimizing boiler performance;

a module for optimizing selective catalytic reduction (SCR); and a module for optimizing flue gas desulfurization (FGD).

31. (currently amended) The method of claim 1, wherein said ~~interconnected processes of the process management modules include a third process that is profit optimization, the third process~~ having a plurality of inputs and an output that is said global output of the network ~~indicative of the profit generated by the fossil fuel power plant, wherein the third process is profit optimization.~~

32. (previously presented) The method of claim 31, wherein an input of said third process is selected from the group consisting of: heat rate (HR), MW, NO_x, NH₃, SO, limestone, emission credits, and fuel costs.

33. (previously presented) The computer program product of claim 18, wherein said first and second processes of the fossil fuel power plant are selected from the group consisting of the following processes: combustion optimization, sootblowing optimization, boiler performance optimization, selective catalytic reduction (SCR) optimization, flue gas desulfurization (FGD) optimization, and profit optimization.

34. (currently amended) The computer program product of claim 18, wherein the first process is combustion optimization, said first input of the first process is selected from the group consisting of: O₂ trim, over fire air (OFA), mill biases, SAD, and cleanliness; and an output of the first process is selected from the group consisting of: boiler losses, boiler NO_x and boiler SO_x.

35. (currently amended) The computer program product of claim 18, wherein the first process is sootblowing optimization, said first input of the first process is selected from the group consisting of: location, pressure and frequency of sootblowing operations; and an output of the first process is selected from the group consisting of: soot losses and cleanliness.

36. (currently amended) The computer program product of claim 18, wherein the first process is SCR optimization, said first input of the first process is selected from the group consisting of: boiler NO_x and NH₃; and an output of the first process is selected from the group consisting of: SCR losses and NO_x.

37. (currently amended) The computer program product of claim 18, wherein the first process is FGD optimization, said first input of the first process is selected from the group consisting of: boiler SO_x and limestone; and an output of the first process is selected from the group consisting of: FGD losses and SO_x.

38. (currently amended) The computer program product of claim 18, wherein the first process is boiler performance optimization, said first input of the first process is selected from the group consisting of: soot losses, cleanliness, boiler losses, SCR losses and FGD losses; and an output of the first process is selected from the group consisting of: heat rate (HR) and MW.

39. (previously presented) The computer program product of claim 18, wherein the first process is managed by a first process management module, wherein the first management module is selected from the group consisting of: a module for optimizing combustion; a module for optimizing sootblowing; a module for optimizing boiler performance; a module for optimizing selective catalytic reduction (SCR); and a module for optimizing flue gas desulfurization (FGD).

40. (currently amended) The computer program product of claim 18, wherein ~~said interconnected processes include a third process that is profit optimization, the third process having a plurality of inputs and an output that is said global output of the network indicative of the profit generated by the fossil fuel power plant, wherein the third process is profit optimization.~~

41. (previously presented) The computer program product of claim 40, wherein an input of said third process is selected from the group consisting of: heat rate (HR), MW, NO_x, NH₃, SO, limestone, emission credits, and fuel costs.